SUCCULENT PLANTS OF OHIO.

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The typical succulents are characteristic of desert and saline regions. There are, however, some fleshy and watery plants which grow in shady and moist places, which show some of the peculiarities of typical succulents. The structures of the xerophytic succulents are highly specialized to harmonize with the usual conditions of the desert. Thickening of the epidermis, the comparatively small number of stomata, the more or less globular form of the stem or leaves in certain species, and the development of special water-storage tissues are among the most striking adaptations to be found in the plant kingdom.

Succulents may be divided into two groups according to their specialized parts. Leaf succulents, in order to restrict transpiration, reduce the surface of their leaves which become more or less cylindrical or globular in shape. These leaves have in their tissuse peculiar cells, called water-storage cells which serve for

4. Ibid. p. 570.

storing up enough water to last from one rainy season to another. These cells are highly specialized, being comparatively large and with thin walls. Many of the typical leaf succulents develop rosettes as in *Sempervivium tectorum*.

Stem succulents have thickened fleshy stems which perform the functions of leaves. Here the stomata are found in the epidermis as in the foliage leaf and the green tissue is contained in the cortex. In many stem succulents the stem becomes leaf-like, or disk-shaped as in Opuntia.

Among the fleshy, watery plants found in our moist woods *Galeorchis spectabilis* is characteristic, while *Adicea pumila* is a good example of the annual plants with delicate watery stems. Probably our most abundant succulent, present almost everywhere in gardens and fields, is the common Purslane, *Portulaca oleracea*.

In the following list, the Ohio plants which might be considered in this connection have been arranged under two heads: first a list of the more typical succulents, and second a general list containing some of the semi-succulent plants present in our flora.

Typical Succulents.

Galeorchis spectabilis (L.) Rydb.
Agave virginica L.
Chenopodium album L.
" glaucum L.
Claytonia virginica L.
" caroliniana Michx.
" perfoliata Doun.
Portulaca oleracea L.
" grandiflora Hook.
Cakile edentula (Bigel) Hook.
Brassica oleracea L.
Sedum telephium L.
" telephioides Michx.
" acre L.
" ternatum Michx.
Sempervivium tectorum L.
Oxalis violacea L.
Opuntia humifusa Raf.

Semi-Succulent Plants.

Chamaelirium luteum (L.) A. Gray.
Allium cepa L.
" cernuum Roth.
" stellatum Ker.
Erythronium Americanum Ker.
Peramium repens (L.) Salisb.
" pubescens (Willd.) MacM.
Adicea pumila (L.) Raf.
Chenopodium leptophyllum (Moq.) Nutt.
Blitum capitatum L.
Salsola tragus L.
Phytolacca decandra L.
Caltha palustris L.
Sanguinaria canadensis L.
Bicuculla cucullaria (L.) Millsp.
" canadensis (Goldie) Millsp.
" eximia (Ker.) Millsp.
Saxifraga pennsylvanica L.
" virginiensis Michx.
Chrysosplenium americanum Schwein.
Impatiens biflora Walt.
" aurea Muhl.
Isnardia palustris L.
Monotropa uniflora L.